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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/805,700	03/22/2004	Toshiro Kawanishi	10844-46US (204002(E-1))	8787

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PHILADELPHIA, PA 19103

EXAMINER	
HOFFBERG, ROBERT JOSEPH	
ART UNIT	**PAPER NUMBER**
2835	

DATE MAILED: 10/13/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

SF

Office Action Summary	Application No.	Applicant(s)	
	10/805,700	KAWANISHI, TOSHIRO	
	Examiner	Art Unit	
	Robert J. Hoffberg	2835	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *01 June 2006*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-288* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-288* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *01 June 2006* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

Detailed Action

1. Applicant's arguments with respect to claims 1-288 have been considered but are moot in view of the new ground(s) of rejection.

2. Regarding applicant's arguments concerning the alleged typographical error in Kawanashi (US 6,040,754). A patent's disclosure is based upon what is disclosed, rather than what is intended to be disclosed. If the Kawanashi is in error, the issued patent should be corrected following the procedures of the U.S. Patent & Trademark office.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

4. Claims 1-2, 5-8, 11-14 and 17-18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tanaka (JP 2002-150906).

With respect to Claims 1, 5-8, 11-14 and 17-18, Tanaka teaches a thermal fuse having a function of a current fuse in which a low-melting fusible alloy piece (Fig. 1a, #4) having an alloy composition containing 40 to 70% Bi (see Claim 1) is connected between a pair of flat lead conductors (#3), a flux (#5) is applied to said low-melting fusible alloy piece, and said flux-applied low-melting fusible alloy piece is sandwiched (See Fig. 1b) between a resin base film (#11) and a resin cover film (#12) to provide insulation (claim 1) and said pair of flat lead conductors, and said flux-applied low-

melting fusible alloy piece which is connected between upper faces (Fig. 1b, #3 top) of tip end portions (Fig. 1a, #3 near #4) of said lead conductors are sealed (Para. 0013, closed) with being vertically sandwiched (see Fig. 1b) between said resin cover film and said resin base film (claims 5-6), a balance of the alloy composition containing 40 to 70% Bi is In and inevitable impurities (see claim 2) (claims 7-8 and 11-12) and a balance of the alloy composition containing 40 to 70% Bi is In, inevitable impurities, and 0.05 to 5% of at least one of Ag (see claim 2), Cu, Au, Sb, Ni, Pt, Pd, Ge, and P (claims 13-14 and 17-18). Tanaka fails to disclose that an operating current of said low-melting fusible alloy piece at 5 ms is larger than 100A. It would have been obvious to one having ordinary skill in the art at the time the invention was made to have a maximum operating current of 5 ms is larger than 100A or any other value which permits the fuse to withstand the initial rush (surge) current, since it has been held that discovering an optimum value of a result effective variable involves only routine skill in the art. *In re Boesch*, 617 F.2d 272, 205 USPQ 215 (CCPA 1980).

With respect to Claim 2, Tanaka teaches the claimed invention including a melting point of said low-melting fusible alloy piece is 85 to 95.degree. C (abstract). Tanaka fails to disclose allowable maximum current is a current of 2 to 10 A and 1,000 seconds. It would have been obvious to one having ordinary skill in the art at the time the invention was made to have a allowable maximum current of 2 to 10A and 1,000 seconds or any other value which permits the fuse to withstand the desired operating current, since it has been held that discovering an optimum value of a result effective

variable involves only routine skill in the art. *In re Boesch*, 617 F.2d 272, 205 USPQ 215 (CCPA 1980).

5. Claims 3-4, 9-10 and 15-16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tanaka (JP 2002-150906) in view of applicant's admitted prior art.

Tanaka teaches the claimed invention including a front end portions (Fig. 1b, #3 lower surface) of said pair of flat lead conductors are secured to a rear face (#11 upper surface) of said resin base film, a part of each of said front end portions is exposed (contact surface of #3 and #4 and Fig. 2) from a surface (#11 upper surface) of said base film, said low-melting fusible alloy piece is connected (see Fig. 1a) between said exposed parts, the flux is applied to said low-melting fusible alloy piece, and an area above (see Fig. 1b) said base film is sealed (Para. 0013, closed) by said resin cover film (claims 3-4), a balance of the alloy composition containing 40 to 70% Bi is In and inevitable impurities (see claim 2) (claims 9-10) and a balance of the alloy composition containing 40 to 70% Bi is In, inevitable impurities, and 0.05 to 5% of at least one of Ag (see claim 2), Cu, Au, Sb, Ni, Pt, Pd, Ge, and P (claims 15-16). Tanaka fails to teach front ends of the flat lead conductors, rear surface and a surface of the resin base film. Applicant's admitted prior art teaches that front end portions (see applicant's prior art Fig. 4, #1' upper surface) of said pair of flat lead conductors are secured to a rear face (#31' lower surface) of said resin base film, a part of each of said front end portions is exposed (contact surface of #1' and #2') from a surface (#31' upper surface) of said base film. It would have been obvious to one of ordinary skill in the art at the time of the

invention was made to modify the fuse of Tanaka with the fuse arrangement of applicant's prior art to that is easy to manufacture and compact in size.

6. Claims 19-20, 23-26, 29-32, 35-38, 41-44, 47-50, 53-56, 59-62, 65-68, 71-74, 77-80, 83-86, 89-92, 95-98, 101-104, 107-110, 113-116, 119-122, 125,128, 131-134, 137-140, 143-146, 149-152, 155-158, 161-164, 167-170, 173-176, 179-182, 185-188, 191-194, 197-200, 203-206, 209-212, 215-218, 221-224, 227-230, 233-236, 239-242, 245-248, 251-254, 257-260, 263-266, 269-272, 275-278, 281-284 and 287-288 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tanaka (JP 2002-150906) in view of Izaki et al. (US 6,556,122).

With respect to Claims 19-20, 23-26, 29-32 and 35-36, Tanaka discloses the claimed invention except for the fuse resistance. Izaki et al. teaches a resistance of said low-melting fusible alloy piece is 4.5 to 50 m Ω (Para. 0188, line 13). It would have been obvious to one of ordinary skill in the art at the time of the invention was made to modify the fuse of Tanaka with the resistance value of Izaki et al. to select the resistance of the low-melting fusible alloy based upon the desired operating conditions and select an alloy, cross section and length piece to be 4.5 to 50 mΩ or any other value to provide for the desired heat dissipation before the low-melting fusible alloy melts, since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art. *In re Aller*, 105 USPQ 233.

With respect to Claims 37-38, 41-44, 47-50, 53-56, 59-62, 65-68 and 71-72, Tanaka discloses the claimed invention except for the ratio of the fuse. It would have

been obvious to one having ordinary skill in the art at the time the invention was made to have the ratio of the outer diameter of the low-melting fusible alloy piece to a thickness of the flat lead conductors to be 2 to 4 or any other value that yields the desired time constant, since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art. *In re Aller*, 105 USPQ 233.

With respect to Claims 73-74, 77-80, 83-86, 89-92, 95-98, 101-104, 107-110, 113-116, 119-122, 125,128, 131-134, 137-140 and 143-144, Tanaka discloses the claimed invention except for the thickness of fuse being 2.0 mm or smaller. Izaki et al. teaches that the a thickness from a lower face of said resin base film to an upper face of said resin cover film is 2.0 mm or smaller (Col. 23, line 29, 1.5mm or smaller). It would have been obvious to one of ordinary skill in the art at the time of the invention was made to modify the fuse of Tanaka with the size of Izaki et al. to allow for a reduction in size to correspond with the reduction in sizes of the secondary batteries (Col. 3, 36-37).

With respect to Claims 145-146, 149-152, 155-158, 161-164, 167-170, 173-176, 179-182, 185-188, 191-194, 197-200, 203-206, 209-212, 215-218, 221-224, 227-230, 233-236, 239-242, 245-248, 251-254, 257-260, 263-266, 269-272, 275-278, 281-284 and 287-288, Tanaka discloses the claimed invention except for the lead conductors are nickel or an iron alloy. Isaki et al. that said flat lead conductors are made of nickel or an iron alloy (Col. 8, line 52). It would have been obvious to one of ordinary skill in the art at the time of the invention was made to modify the fuse of Tanaka in view of the applicant's disclosed prior art with the conductors of Izaki et al. for fabricating the

conductors from a metallic material with excellent strength characteristics (Col 8, line 50).

7. Claims 21-22, 27-28, 33-34, 39-40, 45-46, 51-52, 57-58, 63-64, 69-70, 75-76, 81-82, 87-88, 93-94, 99-100, 105-106, 111-112, 117-118, 123-124, 129-130, 135-136, 141-142, 147-148, 153-154, 159-160, 165-166, 171-172, 177-178, 183-184, 189-190, 195-196, 201-202, 207-208, 213-214, 219-220, 225-226, 231-232, 237-238, 243-244, 249-250, 255-256, 261-262, 267-268, 273-274, 279-280 and 285-286 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tanaka (JP 2002-150906) in view of applicant's admitted prior art as applied to the above claims, and further in view of Izaki et al. (US 6,556,122).

With respect to Claims 21-22, 27-28 and 33-34, Tanaka in view of applicant's admitted prior art discloses the claimed invention except for the fuse resistance. Izaki et al. teaches a resistance of said low-melting fusible alloy piece is 4.5 to 50 m Ω (Para. 0188, line 13). It would have been obvious to one of ordinary skill in the art at the time of the invention was made to modify the fuse of Tanaka in view of applicant's admitted prior art with the resistance value of Izaki et al. to select the resistance of the low-melting fusible alloy based upon the desired operating conditions and select an alloy, cross section and length piece to be 4.5 to 50 mΩ or any other value to provide for the desired heat dissipation before the low-melting fusible alloy melts, since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art. *In re Aller*, 105 USPQ 233.

With respect to Claims 39-40, 45-46, 51-52, 57-58, 63-64 and 69-70, Tanaka in view of the applicant's admitted prior art disclose the claimed invention except for the ratio of the fuse. It would have been obvious to one having ordinary skill in the art at the time the invention was made to have the ratio of the outer diameter of the low-melting fusible alloy piece to a thickness of the flat lead conductors to be 2 to 4 or any other value that yields the desired time constant, since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art. *In re Aller*, 105 USPQ 233.

With respect to Claims 75-76, 81-82, 87-88, 93-94, 99-100, 105-106, 111-112, 117-118, 123-124, 129-130, 135-136 and 141-142, Tanaka in view of the applicant's admitted prior art disclose the claimed invention except for the thickness of fuse being 2.0 mm or smaller. Izaki et al. teaches that the a thickness from a lower face of said resin base film to an upper face of said resin cover film is 2.0 mm or smaller (Col. 23, line 29, 1.5mm or smaller). It would have been obvious to one of ordinary skill in the art at the time of the invention was made to modify the fuse of Tanaka in view of the applicant's admitted prior art with the size of Izaki et al. to allow for a reduction in size to correspond with the reduction in sizes of the secondary batteries (Col. 3, 36-37).

With respect to Claims 75-76, 81-82, 87-88, 93-94, 99-100, 105-106, 111-112, 117-118, 123-124, 129-130, 135-136 and 141-142, Tanaka in view of the applicant's admitted prior art disclose the claimed invention except for the thickness of fuse being 2.0 mm or smaller. Izaki et al. teaches that the a thickness from a lower face of said resin base film to an upper face of said resin cover film is 2.0 mm or smaller (Col. 23,

line 29, 1.5mm or smaller). It would have been obvious to one of ordinary skill in the art at the time of the invention was made to modify the fuse of Tanaka in view of the applicant's admitted prior art with the size of Izaki et al. to allow for a reduction in size to correspond with the reduction in sizes of the secondary batteries (Col. 3, 36-37).

With respect to Claims 147-148, 153-154, 159-160, 165-166, 171-172, 177-178, 183-184, 189-190, 195-196, 201-202, 207-208, 213-214, 219-220, 225-226, 231-232, 237-238, 243-244, 249-250, 255-256, 261-262, 267-268, 273-274, 279-280 and 285-286, Tanaka in view of the applicant's admitted prior art disclose the claimed invention except for the lead conductors are nickel or an iron alloy. Isaki et al. that said flat lead conductors are made of nickel or an iron alloy (Col. 8, line 52). It would have been obvious to one of ordinary skill in the art at the time of the invention was made to modify the fuse of Tanaka in view of the applicant's admitted prior art with the conductors of Izaki et al. for fabricating the conductors from a metallic material with excellent strength characteristics.

Conclusion

8. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Isaki et al. (JP 2002-2237240) and Senda et al. (US 2004/0166405) teach a fuse having a thickness of 2 mm or less. Ando (JP 07-153367) and Kawanishi (JP 2001-118480) teach a current fuse in which a low-melting fusible alloy piece having an alloy composition containing 40 to 70% Bismuth.

9. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP

§ 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Robert J. Hoffberg whose telephone number is (571) 272-2761. The examiner can normally be reached on 8:30 AM - 4:30 PM Mon - Fri.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Lynn D. Feild can be reached on (571) 272-2092. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

MICHAEL DATSKOVSKIY
PRIMARY EXAMINER

10/11/06

RJH